



Response to Public Comments Received on
January 2009 Draft WaterSense®
High-Efficiency Flushing Urinal Specification

October 8, 2009

Background

This document provides WaterSense's responses to public comments received on the January 8, 2009, Draft High-Efficiency Flushing Urinal Specification. The actual comments can be viewed at http://www.epa.gov/watersense/specs/urinal_spec.htm.

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I. General Specification Comments

Specification Name

- a. One commenter recommended changing the name of the High-Efficiency Flushing Urinal Specification to eliminate “flushing” from the title, as the scope applies to the urinal fixture and the pressurized flushing device. Literally the fixture is not a flushing device.

Response: While WaterSense recognizes that the urinal fixture itself is technically not a flushing device, the word “flushing” is retained in the specification title to make it clear that the specification applies to flushing urinal systems only, not composting or non-water urinals.

WaterSense has, however, modified the final specification name by removing the term “high-efficiency.” As all WaterSense labeled products are water-efficient and high-performing by definition, including this phrase in specification names is redundant and unnecessary.

Reference to Standards

- b. Several commenters recommended updating all references to the American Society of Mechanical Engineers (ASME) A112.19.2 to also include the appropriate Canadian Standards Association (CSA) B145.1 standard to reflect the fact that these standards have been harmonized.
- c. Another commenter suggested including a reference to CSA B125.3 when American Society of Sanitary Engineering (ASSE) #1037 is cited in the specification, as this CSA standard is also referenced in many U.S. model plumbing codes as being equivalent to ASSE #1037 (though the two standards have not yet been harmonized).
- d. One commenter suggested that the references to International Association of Plumbing and Mechanical Officials (IAPMO) Z124.9 be changed to American National Standards Institute (ANSI)/IAPMO Z124.9. Another commenter suggested that the reference to IAPMO Z124.9 should be changed to ANSI Z124.9, as IAPMO was the sponsor of this ANSI standard, but that it is an ANSI and not an IAPMO standard.

Response: WaterSense agrees with the general principle of these comments that the standards need to be referenced by the full and appropriate titles and acknowledge all parties involved in their publication. As such, WaterSense has updated the references where appropriate to indicate harmonization of the ASME and CSA standards. Specifically the references have been changed to ASME A112.19.2/CSA B45.1 (Ceramic Plumbing Fixtures) and ASME A112.19.3/CSA B45.4 (Stainless Steel Plumbing Fixtures). In addition, WaterSense has acknowledged that all of these standards are ANSI standards, thus eliminating confusion over identifying the IAPMO Z124.9 standard as an ANSI/IAPMO standard.

In the case of ASSE #1037—*Pressurized Flushing Devices (Flushometers) for Plumbing Fixtures*, even though CSA B125.3 *Plumbing Fittings* is referenced in many U.S. model plumbing codes as being equivalent to ASSE #1037, the two standards have not been officially harmonized at this time. As a result, and because not all urinals are required to conform to CSA B125.3 in order to be sold in the United States, WaterSense cannot recognize CSA B125.3 as being equivalent to ASSE #1037. WaterSense has decided to retain only that the pressurized flushing device must conform to ASSE #1037.

As an additional update, in Section 4.1 WaterSense has modified the type of urinal fixtures covered by the ASME A112.19.2/CSA B145.1 standard from “vitreous china” to “ceramic” to remain consistent with the scope of the most current version of this standard.

Specification Revision

- e. One commenter urged the adoption of the specification at its earliest practical date, and suggested that the U.S. Environmental Protection Agency (EPA) should state its intention to periodically review and update the specification as warranted by economic and technological developments in the marketplace.

Response: As stated in Section 8, Future Specification Revisions, of the draft and final specification, EPA reserves the right to revise the specification at any time that it deems that technological or market changes affect the usefulness of the specification. EPA fully intends to continue monitoring the development of technologies and changes in the market and will revise the specification, as appropriate. Revisions will be made following discussions with industry partners and other interested stakeholders.

Publication of Maintenance Requirement Information

- f. One commenter suggested that WaterSense include a tabulation of manufacturers’ recommended maintenance requirements for urinals as part of the evaluation. The commenter suggested that the analysis should include both the economic and environmental costs to facilitate comparisons between high-efficiency urinal products (e.g., comparing a flushing high-efficiency urinal to a non-water urinal). This analysis would provide procuring bodies with important information to help them intelligently choose between flushing and non-water urinals. The commenter went on to suggest that WaterSense list on its Web site the maintenance requirements, frequency, and costs of required maintenance products.

The commenter offered another option, which was to establish a maximum allowed maintenance requirement to earn the WaterSense label (e.g., one routine maintenance activity, such as replenishing the barrier sealant every 90 days). The commenter also suggested that WaterSense could require manufacturers to provide a documented record of at least one year of satisfactory service in field installations to earn the WaterSense label. Alternatively, WaterSense could allow users to post feedback about specific products on the WaterSense Web site.

Response: As this specification only applies to flushing urinals, the comparison of maintenance requirements between flushing and non-water urinals proposed by the commenter is not germane to the development and finalization of this specification. With regard to flushing urinals, WaterSense has determined that the performance requirements contained in the consensus-based standards referenced in the specification are sufficient to ensure long-term consumer satisfaction with the products that bear the WaterSense label.

WaterSense does have a mechanism in place to receive feedback regarding product performance. Simply send an e-mail to watersense@epa.gov or call the WaterSense Helpline at (866) WTR-SENS (987-7367). WaterSense will use the information received to engage in corrective action with the manufacturer, as appropriate and warranted, and to inform future revisions to the specification.

Life-Cycle Impact Evaluation

- g. One commenter encouraged WaterSense to perform a thorough evaluation of the life-cycle impacts of using non-water urinals to provide procurers with complete information when making urinal system purchasing decisions.

Response: Since this specification only applies to flushing urinals, the life impact analysis associated with non-water urinals does not have any bearing on the development and finalization of this specification.

Drain Line Buildup

- h. One commenter requested that as research on the causes and risks of solids buildup in drain lines from non-water and very low volume flushing urinals is published that WaterSense take these findings into consideration and revise the specification as appropriate.

Response: WaterSense intends to monitor new urinal technologies, new performance-related data, and any changes in the urinal market, as it emerges. As the technologies and markets continue to evolve and as new pertinent performance data are released, WaterSense will determine if any changes to the final specification are warranted and, if necessary, will make the appropriate changes following discussions with industry partners and other interested stakeholders.

II. Comments on Section 1.0 – Scope and Objective

Retrofit Devices

- a. One commenter suggested that the specification be revised to include retrofit flushing devices (specifically a retrofit flush handle), particularly since WaterSense stated its intent was to assist consumers in identifying and differentiating those products that have met the EPA's criteria for water efficiency and performance. The commenter went on to

say that without rebates or some other economic incentive, replacing properly functioning 1.0 gpf urinals with high-efficiency 0.5-gpf fixtures might not make sense from a purely economic standpoint.

Response: With this specification, WaterSense is maintaining its existing policy of not labeling retrofit components. WaterSense intends to label only fully assembled and functioning urinal flushing devices and flushing urinal fixtures. At this time, retrofit devices, including separately sold flush valve handles, are not eligible for the WaterSense label. WaterSense is excluding retrofit devices because there are no applicable standards against which such devices must be tested to ensure their performance. Without such standards, there is no method to evaluate whether performance requirements and water savings will be achieved.

Tank-Type Urinals

- b. Two commenters requested that tank-type gravity flushing urinals be included in the specification. As per ASME A112.19.2, both flushing devices are allowed and there are products on the market that can meet the water-efficiency criteria contained in the specification.

Response: It was not WaterSense's intention to exclude this category of flushing urinal from the specification. WaterSense has revised Sections 1.0 and 5.0 of the specification to specifically include and address gravity tank-type flushing urinals.

Urinals in Residential Applications

- c. One commenter questioned whether residential urinals and pressurized flushing devices used in residential applications were excluded from the scope of the specification since the cover letter accompanying the release of the draft specification and the supporting statement indicated that the draft specification is for *commercial* plumbing products.

Response: It is not WaterSense's intention to limit the specification only to flushing urinals installed in commercial applications. A primarily residential system can qualify for the label if it meets the requirements of the specification. WaterSense has revised the supporting statement associated with the final specification to remove the term "commercial" so as to avoid any confusion or misunderstanding of the scope of this specification.

Non-Water Urinals

- d. Numerous commenters urged WaterSense to revise the proposed specification to include non-water urinals. Commenters indicated that there is a wide availability of non-water urinal technology options on the market from multiple manufacturers and that EPA should be encouraging the use of the most water-efficient technology available. In addition, commenters suggested that leaving non-water urinals out of the specification may competitively disadvantage non-water urinal manufacturers, confuse the market (as non-water urinals serve the same basic function as flushing urinals), stifle conservation

efforts, and call into question the validity of the WaterSense program. Several commenters also provided testimonials as to the performance, user satisfaction, and water savings of non-water urinals in the field in a variety of installations and applications.

Some commenters also indicated that many of the potential drain line issues that have been cited about non-water urinals have not been adequately studied in high-efficiency urinals, particularly those with very low flush volumes, and that it seems arbitrary to allow into the program urinals that flush 0.13 gallons or less but not non-water urinals. The commenters went on to suggest that absent a minimum flush volume, based on adequate testing, non-water urinals should be included in the specification as WaterSense has no basis to propose improvements to the two existing non-water urinal standards. Further, commenters indicated that EPA recognizes that all urinals, including non-water urinals, are already subject to rigorous performance standards and pointed out that the national model plumbing codes have approved non-water urinals. Commenters urged EPA to defer to the expertise of the standards and codes setting bodies and include non-water urinals in the specification.

Response: As stated in the supporting statement that accompanied the release of the draft specification, WaterSense considers flushing urinals and non-water urinals two distinct technologies that are subject to two very different sets of standards. As also stated in the supporting statement, WaterSense has no basis to improve upon the existing standards for non-water urinals. Consequently, WaterSense has no means to help purchasers distinguish among this category of product based upon either their efficiency or performance. To make the most efficient use of its limited funding, WaterSense has decided at this time not to label non-water urinals as these products do not use water and therefore are inherently water-efficient.

It is important to note, however, that the WaterSense Specification for Flushing Urinals does not preclude or prevent the use on non-water urinals in water efficiency, green building or other conservation programs. In fact, non-water urinals continue to be compatible with and a key component of the U.S. Green Building Council's (USGBC's) Leadership in Energy and Environmental Design (LEED) program and other green building programs. WaterSense encourages designers, specifiers, and facility managers to consider all available technologies when making purchasing decisions concerning water-using products, including non-water urinals. The specification and WaterSense label are simply one of many tools available to help consumers make informed purchasing decisions. If decision-makers decide to specify and install water-using urinals, then WaterSense encourages them to choose products with the WaterSense label.

Clarification of Trap Seal

- e. Several commenters suggested that the application statement for urinal fixtures be updated to say: "Urinal fixtures that receive liquid waste and use water to convey the waste through a liquid trap seal into a gravity drainage system."

Response: WaterSense has determined that it is not necessary to make this change regarding the type of allowable trap seals since this specification only applies to flushing urinals, and all flushing urinals would inherently use a liquid trap seal.

This comment was provided to EPA within the context of the commenter requesting that non-water urinals be included in the specification. Within in that context, including the term “liquid” trap seal in the applicability statement in Section 1.0 would preclude mechanical traps from meeting the requirements of the specification.

III. Comments on Section 3.0 – Water-Efficiency Criteria

Maximum Flush Volume

- a. Two commenters suggested that WaterSense should lower the proposed maximum flush volume of urinals from 0.5 gpf to 0.125 gpf (1-pint). These commenters indicated that WaterSense should be more aggressive in challenging manufacturers to achieve the greatest water savings possible, particularly given the intense drought conditions in parts of the country, the growing demand on water-related infrastructure, the fact that several states are moving toward adopting 0.5-gpf urinals as the standard for urinals in new construction, and the existence of several models of urinals with flush volumes less than 0.5 gallons (i.e., 0.25 gpf, 0.125 gpf/1-pint, non-water urinals).

One of the commenters also suggested an alternative to establish two levels of high-efficiency urinals under the specification: “high-efficiency urinals” that use 0.125 (1-pint) gpf and “ultra-efficiency urinals” that use 0.25 (1-quart) gpf or less.

- b. One commenter expressed support of the 0.5-gpf flush rate that is currently written in the draft specification, as it is in line with USGBC’s requirements.

Response: At this time, WaterSense decided not to lower the maximum average flush volume for urinals in the final specification. As stated in the supporting statement that accompanied the release of the draft specification, setting the maximum average flush volume at 0.5 gpf represents a 50 percent increase in efficiency over standard models. Also, 0.5 gpf is the widely accepted industry definition of a high-efficiency urinal and, as one commenter pointed out, it has been widely adopted in most green building standards. WaterSense will continue monitoring the state of urinal technology, markets, and standards. Should 0.5 gpf become a federal efficiency standard or should the market shift such that 0.5 gpf urinals hold a significant percentage of the total urinal market share, WaterSense will reevaluate and consider appropriate revisions to the specification.

In response to the suggestion to establish two levels of high-efficiency urinals, WaterSense is not at this time trying to differentiate between products in terms of their degree of water efficiency. The goal of WaterSense is to clearly identify products in the marketplace that are water-efficient when compared to their standard counterparts. The

WaterSense label will clearly identify these products and give purchasers an easily understood reference point for their purchasing decisions.

- c. One commenter suggested that WaterSense allow for variations in flush volume for sensor-operated pressurized flush devices depending on the frequency of flushing as long as the average flush volume does not exceed 0.5 gpf. The commenter states that it has been found effective to provide a full flush only after four to five light flushes in intensive-use situations. This would reduce the average flush volume and peak flow in high-intensity settings, such as stadiums or theaters. The commenter indicated that there should also be a time delay specified for sensors that prevents them from operating as people walk by and recommended a minimum of five seconds.

Response: While WaterSense understands the benefits of using such “smart” actuators in flushing devices that vary flush volumes in response to the frequency of use of a urinal, WaterSense has no method of specifying or certifying these devices. Specifically, WaterSense has no method for determining their water efficiency, as they could be set to occasionally exceed the maximum flush volume established by the specification. At this time there are no industry standards to test sensor actuator performance. Consequently, WaterSense has no reference point to ensure proper performance of sensor actuators. Should a standard become available, WaterSense will consider it in future revisions to the specification.

Manufacturer Stated (Rated) Maximum Flush Volume

- d. Though WaterSense did not receive direct comments regarding the manufacturer stated (“rated”) flush volume, please note that for clarification purposes, WaterSense has made a significant change to the language of Section 3.0. The original language presented in the proposed draft specification simply required that average flush volume of the flushing device and urinal fixture not exceed 0.5 gpf. WaterSense has revised this section to require the manufacturer to specify the “average maximum” flush volume of its product, which is not to exceed 0.5 gpf. This specified volume is referred to as the “rated flush volume.” When the product is tested, its average maximum flush volume cannot exceed its rated flush volume. In addition the product must meet all of the specification’s requirements at the rated flush volume.

The purpose of this change is to ensure that a product marketed with an average maximum flush volume of less than 0.5 gpf (e.g., 0.25 gpf, 0.125 gpf) does in fact function and perform at that advertised flush volume. WaterSense wants to avoid a situation where a flushing urinal marketed as a 0.125 gpf product actually operates at a significantly higher flush volume that is still less than 0.5 gpf. As originally worded, such a product could potentially still receive the WaterSense label because its maximum flush volume does not exceed 0.5 gpf, even though it does not perform as marked and marketed. To ensure purchaser satisfaction and longevity of water savings, WaterSense is now requiring that a product marketed as performing at a specific flush volume actually perform at that stated flush volume.

IV. Comments on Section 4.0 – Urinal Fixture Requirements

Flush Volume Clarification

- a. One commenter indicated that WaterSense should more clearly identify what it means by the maximum flush volume (mentioned in Section 6.0 of the draft specification) and relate it back to an outlined section within the specification. The commenter suggested revising the wording in Section 4.1 and 4.2 as follows:

“...pressurized flushing device with ~~the same a~~ rated flush volume that meets the maximum requirements of outlined in Sections...”

Response: Rather than revising the wording in Section 4.0 to include the term “maximum,” WaterSense has revised Section 3.0 to clarify that the water-efficiency criteria is applicable to the average “maximum” water consumption. As described above, the average maximum water consumption is specified by the manufacturer as the “rated flush volume” of the product. For clarification purposes WaterSense has removed this term “maximum flush volume” from Section 6.0 and replaced it with “rated flush volume,” making the terminology throughout the specification consistent.

The purpose of the change is to clarify that WaterSense is requiring flushing devices to be tested with fixtures that have the same rated flush volume (as specified by the manufacturer and verified through testing). Revising the specification as the commenter suggested would allow flushing devices and fixtures with different flush volumes to be tested and installed together as long as the flush volume of the flushing device does not exceed 0.5 gpf. WaterSense has always stated, and will continue to emphasize, the importance of ensuring that flushing devices and fixtures be properly matched in regards to rated flush volume to ensure performance and long-term user satisfaction and water savings.

Stainless Steel Urinals

- b. During WaterSense’s flushing urinals draft specification public meeting on February 5, 2009, one commenter noted that stainless steel urinals should be included in the final specification, and the reference to their corresponding standard (ASME A112.19.3/CSA B45.4) added to Section 4.0.

Response: It was not WaterSense’s intention to exclude stainless steel urinal fixtures from this specification. Accordingly, Section 4.0 has been revised to include stainless steel urinals that conform to ASME A112.19.3/CSA B45.4—*Stainless Steel Plumbing Fixtures*.

V. Comments on Section 5.0 – Pressurized Flushing Device Requirements

Sensor Actuators

- a. Several commenters expressed concern that the proposed specification does not address electronic sensor actuators (flushing type devices). A common complaint with sensor-activated pressurized flushing devices is ghost flushing (false actuation) that wastes water. Commenters expressed concern that otherwise compliant pressurized flushing devices that are equipped with a poor sensor will visibly waste water and have the potential to detract from the WaterSense brand. One of the commenters recognized that there is no current industry standard for sensor performance and that as such, a standard would need to be developed with support from product manufacturers. This commenter went on to suggest that a standard for sensor actuators be included in a future revision of the high-efficiency flushing urinal specification, as they do not wish this requirement to hold up the release of the current specification.

Response: While WaterSense agrees that false activation by electronic sensor actuators can be a very real and serious water conservation concern, sensor actuator design, operation and standards are currently beyond the scope of this specification. In addition, to WaterSense's knowledge there are no existing industry standards to test sensor performance at this time, thus WaterSense does not have a reference or process by which to ensure proper performance of sensor actuators. As standards are developed for these devices, WaterSense will consider their inclusion in future revisions to the specification.

- b. Several commenters requested that the non-hold open actuator requirement only apply to the primary flushing actuator, and not to secondary actuator mechanisms. These commenters pointed out that many sensor-activated flushing devices have secondary manual actuators for emergencies (e.g., loss of power), battery failure, or maintenance reasons and that the maintenance staff need a way to operate the valve to evacuate waste and maintain hygienic bathrooms without the use of the sensor. Since these secondary actuators are not intended to be the primary flushing actuator and are independent of the electronics and are for emergency use only, they are not typically compliant with the non-hold open requirement. The commenters indicated that requiring the secondary actuators to comply with this requirement could add an unnecessary burden and be cost prohibitive for manufacturers.

Response: WaterSense recognizes the concerns of the commenters and agrees that requiring the secondary actuators to comply with the non-hold-open design requirement could be unnecessarily burdensome and cost prohibitive and may pose very little impact on the overall water consumption of the urinals in the field. Accordingly, Sections 5.1.2 and 5.2.2 have been revised to read as follows:

- 5.1.2 The pressurized flushing device must not exceed the rated flush volume of water specified in Section 3.1.1 even if the primary actuator is maintained in the flush position (i.e., device's primary actuator must be a non-hold-open design).

- 5.2.2 The flush tank (gravity type) flushing device must not exceed the rated flush volume of water specified in Section 3.1.1, even if the primary actuator is maintained in the flush position (i.e., the device's primary actuator must be a non-hold open design).

Non-Adjustability

- c. One commenter suggested that flushing device adjustability be allowed as long as the maximum flush volume is not allowed to exceed 0.5 gpf.
- d. Another commenter proposed allowing up to 15 percent adjustability based upon an individual fixture's maximum rated flush volume. The commenter pointed out that adjustability should not be misconstrued as a means of tampering with a pressurized flushing device to increase its maximum flush volume. This commenter also asserted that a certain amount of adjustability is necessary to allow a pressurized flushing device to operate effectively across the wide range of water pressures it may encounter when installed in the field. In addition, urinal designs may differ and a small amount of adjustability allows for fine tuning the valve to attain the intended flush volume in the event of short flushing. This adjustability may become imperative in a non-matched system where a given high-efficiency urinal valve is fitted to a randomly chosen high-efficiency urinal fixture.
- e. During further discussion with manufacturers and industry experts, WaterSense proposed the idea of allowing for some adjustability based upon a percentage of a flushing device's maximum flush volume (e.g., 15 percent). Commenters generally agreed on the need for some adjustability, but expressed concern that the accuracy and precision of flush valves does not increase as flush volume decreases. Therefore, meeting a 15 percent adjustability allowance would be more difficult for flushing devices at the lower end of the flush volume spectrum. Several commenters also pointed to the approach used in the High-Efficiency Tank-Type Toilet Specification, which allows a fixed volume per flush variability, as a workable approach. The commenters agreed that including a static, or fixed, variability allowance rather than an allowance based upon a percentage of a fixture's maximum flush volume was more viable and by consensus suggested that the adjustability be set to ± 0.1 gpf (0.4 liters per flush [Lpf]).

Response: WaterSense understands the commenters' concern for allowing some degree of field adjustability for flushing devices. In the original Notification of Intent (NOI) to Develop Draft Performance Specifications for High-Efficiency Urinals released on May 22, 2008, WaterSense stated that valves would need to be non-adjustable "within some tolerance to be determined." After consulting with several industry experts and flushing device manufacturers, WaterSense has decided to include an adjustability allowance to address the ranges of water pressure found in the field and allow fine tuning when matching flushing devices to fixtures. As indicated in Section 5.1.3, flush volume adjustments on pressurized flushing devices must not allow a greater than ± 0.1 gpf increase in the device's manufacturer stated (rated) flush volume. As indicated in Section 5.2.3, for gravity tank-type flushing devices, the average maximum volume of

water discharged by the tank can not vary by more than ± 0.1 gpf, from the rated flush volume when field adjustment of the tank trim is set at its maximum water use setting.

Non-Interchangeable Parts

- f. Several commenters suggested that WaterSense clarify the language in Section 5.4, describing the restriction of interchangeable parts. The commenters indicated that they understood the intent of this requirement and supported the concept, but expressed concern that as worded, the requirement could hinder the ability of facilities to properly maintain and repair flushometer valves in a resource- and cost-effective manner. Two commenters recommended revising this section to read:

“...any maintainable or replaceable flushing device parts must be designed that such parts are not interchangeable with parts that would cause the flushing device to exceed the initial rated flush volume of the flushing device.”

- g. Several commenters suggested that Section 5.4 be removed altogether. The commenters indicated this requirement is unnecessarily design restrictive because the fixture is clearly marked and maintenance personnel and plumbers are trained to replace inside components with proper repair components based on flush volume. In addition all aftermarket documentation including parts lists and maintenance guides clearly identifies the proper components to use. One commenter asserted that all segments of the distribution chain know where to find these parts and how use them. In addition, most high-efficiency urinal fixtures have different drain specifications that will not support flush valves that flush at a higher flush volume. In many situations placing a non-high efficiency flush valve on a high-efficiency urinal fixture will result in flooding. In addition, one commenter was not aware of a product available on the market that can meet this non-interchangeable parts requirement.

Other commenters in support of removing the interchangeable part requirement indicated that the perceived benefit of disallowing interchangeable parts is negated based upon added costs and lost water savings opportunities. They indicated that this requirement would inhibit facility owners from retrofitting an existing pressurized flushing device from a higher consumption to a lower consumption model, which is a more cost-effective approach to achieving the water savings.

- h. Another commenter felt that the interchangeable parts should be allowed as long as their use does not allow the pressurized flushing device to exceed 0.5 gpf. The commenter argued that interchangeable parts allow for standardized components across product lines and allow facility managers to reduce spare parts inventories. As written the requirement could possibly force manufacturers to create special components and tooling for its various products that meet the WaterSense specification.

The commenter suggested rephrasing Section 5.4 to say: “The pressurized flushing device must not contain interchangeable parts, such as pistons or diaphragms, which if replaced with commonly available alternative components would allow the device to flush with more than 0.5 gpf.”

- i. Similarly, another commenter suggested that WaterSense should limit interchangeable parts to only those parts that maintain the urinal's rated flush volume. Field adjustability has the potential to erode water savings, degrade flushing performance, and compromise the WaterSense label. To ensure rated performance, the commenter suggested that limits on interchangeable parts preclude flushing at lower than rated volumes as well as higher than rated volumes. The commenter suggested that WaterSense modify Section 5.4 to state:

“The pressurized flushing device must not contain interchangeable parts, such as pistons or diaphragms, which, if replaced with commonly available alternative components would allow the device to flush at other than its rated flush volume.”

Response: WaterSense has determined that retaining the intent that flushing devices cannot have parts that can be replaced with components that would allow the device to flush at a higher maximum flush volume is essential for preserving long-term efficiency and performance of WaterSense labeled products. Because of the way some pressurized flushing devices are designed, without this requirement, a 0.5 gpf flushometer valve could easily be retrofit with components that would allow it to flush at 1.0 gpf or greater. Whether this retrofitting is intentional or accidental, the end result is a loss in water savings and the potential erosion of the WaterSense label's integrity. WaterSense recognizes that this requirement potentially places a new burden on manufacturers, but has determined that protecting long-term water savings justifies this additional requirement.

While allowing interchangeable parts as long as the new component does not allow the flushing device's maximum volume to exceed 0.5 gpf, as proposed in comment (h) above, at first appears to be a reasonable compromise, this also presents a sustainability and credibility issue. This could result in situations where a flushing device with a less than 0.5-gpf rated flush volume (e.g., a 0.125-gpf rated flushing device) could be retrofit with a 0.5-gpf component resulting in performance issues (e.g., flooding). Even situations where the higher flush volume component does not create performance issues, the water savings anticipated from the installation of the original system will not be recognized. Such scenarios could undermine the integrity of the WaterSense label and reduces potential water savings.

WaterSense does want to be clear in its intent with this non-interchangeable parts requirement, however. To clarify the intent, WaterSense has revised the language in Sections 5.1.4 and 5.2.4, respectively, to read:

- 5.1.4 The manufacturer must attest that the pressurized flushing device is designed such that replaceable or maintainable parts (e.g., pistons or diaphragms) are not intended to be interchangeable with parts that would cause the device to exceed the rated flush volume specified in Section 3.1.1.

- 5.2.4 The manufacturer must attest that the flushing device is designed such that replaceable or maintainable parts are not intended to be interchangeable with parts that would cause the device to exceed the rated flush volume specified in Section 3.1.1.

In response to the comments asserting that this non-interchangeability requirement will undermine water savings achieved through the retrofitting of lower flush volume components into existing, less-efficient fixtures (e.g., replacing a 1.0-gpf diaphragm with a 0.5-gpf diaphragm), nothing in this specification would prohibit such actions. This specification solely applies to the manufacture of fully assembled and functioning flushing devices. Manufacturers can continue to market more-efficient replacement parts for older fixtures.

- j. Another commenter questioned how this requirement would be policed in the field and asked what is to prevent a third party (i.e., someone other than the flushometer valve manufacturer) from making a replaceable part for any given valve, that when installed would allow the flush volume to exceed the original rated flush volume.

Response: The WaterSense label only applies to new products as they are sold. Once in the field, WaterSense relies upon the conscientiousness and diligence of the parties involved in maintaining these fixtures to guard against abuse. The intent of the non-interchangeability requirement is to eliminate the cases where a similar component with a greater flush volume is mistakenly placed into a WaterSense labeled urinal during regular maintenance or repair. The product marking requirement, while primarily intended to prevent mismatching of flushing devices and fixtures during purchase and installation, also has the added benefit of helping maintenance and repair staff identify the appropriate replacement parts.

WaterSense does not have the ability to prevent a third party from manufacturing replacement parts that are designed to maneuver around the interchangeability requirement of the specification, thus undermining the water efficiency and savings of WaterSense labeled urinals. While this is possible, it seems unlikely that someone would voluntarily choose to purchase and install a WaterSense labeled flushing urinal and then consciously work to defeat the water-efficiency features by purchasing and installing an inefficient replacement component.

Recognizing that the manufacturer has limited control once the product is installed in the field, WaterSense has revised this requirement to state that the manufacturer must design the product such that replaceable or maintainable parts are not intended to be interchangeable with parts that would cause the product to exceed its rated flush volume. By adding the word “intended,” WaterSense is accepting a good faith effort by the manufacturer to help the program, to the extent possible under this specification, maintain the water savings and performance of labeled urinals in the field. For example, a flushing device rated at 0.5 gpf that accepted existing replacement 1.0-gpf pistons or diaphragms would not be a product that meets WaterSense's intentions for this requirement.

- k. One commenter was not sure what “commonly available alternative components” meant and sought clarification of this vague terminology.

Response: In the revised wording of Sections 5.1.4 and 5.2.4, the phrase “commonly available alternative components” has been removed. WaterSense agrees that this phrase was undefined and created confusion.

- l. A certifying body that intends to certify flushing urinals to this specification expressed concern about its ability to verify a product’s compliance with the non-interchangeable parts requirement and recommended that WaterSense require the manufacturer to attest that its product meets this requirement.

Response: WaterSense agrees that this requirement as proposed in the draft specification was not easily verified by the certifying body. WaterSense has clarified in Sections 5.1.4 and 5.2.4 that the manufacturer must attest that the flushing device complies with this requirement.

VI. Comments on Section 6.0 – Marking

Marking Standards

- a. One commenter questioned what the phrase “in accordance with 16 CFR 305.11(f)” means and whether it could be removed. The concern specifically relates to the requirement that the urinals be marked with the designation ASME A112.19.2M to signify compliance with the applicable standard.
- b. One commenter suggested that the word “average” be inserted between “the” and “maximum.”
- c. One commenter suggested that WaterSense require both the product and the product packaging to be marked with the maximum flush volume. This commenter indicated that permanent marking of the flush volume on both the product and the product packaging is necessary because commercial building owners, managers, and maintenance staff all change over time. A permanent mark on the fixture and valve will ensure proper maintenance and facilitate any future onsite audits of water consumption. The commenter suggested that WaterSense revise Section 6.0 to say “The product and the product packaging must be marked....”

Response: In response to these comments and other discussions with stakeholders concerning the marking of other WaterSense labeled products, and changes made to Section 3.0 of the specification, the language in Section 6.0 has been changed to read:

- 6.1 The urinal fixture and flushing device product and product packaging must be marked with the rated flush volume in gpf and Lpf as specified by the manufacturer in Section 3.1.1, verified through testing and in compliance with this specification.

- 6.2 Marking must be in gpf and Lpf in at least two digit resolutions (e.g., 0.5 gpf [1.9 Lpf]).

WaterSense has made four notable changes to the marking requirements in Section 6.1. First, WaterSense has clarified that the marking requirements apply to both the urinal fixture and flushing device. Second, WaterSense has required the product and the product packaging to both be marked with the rated flush volume. These two clarifications will facilitate matching urinal fixtures and flushing devices for initial purchase, or once installed in the field, with identifying the right replacement flushing devices, fixtures, or components, thus helping to ensure that long-term performance and water savings are preserved.

Third, in revising the language of this section, the term “maximum flush volume” has been replaced with “rated flush volume.” The intent is for the manufacturer to clearly mark both the product and product packaging with the products’ designed/intended flush volume. This clarification serves two purposes. WaterSense wants to be clear that it does not intend for the manufacturer to mark the product with the actual average flush volume, as tested (e.g., a flushing device that is designed and specified by the manufacturer to flush at 0.5 gpf, may have a tested average maximum flush volume of 0.4 gpf). Instead, the product and packaging should be marked with the manufacturer’s designated (rated) flush volume (e.g., 0.5 gpf/1.9 Lpf). Also, this language is designed to encourage manufacturers to mark the product with the rated flush volume (e.g., 0.5, 0.25, 0.125) instead of the maximum allowable flush volume designated by the Energy Policy Act of 1992 (i.e., 1.0 gpf/3.8 Lpf). Marking with the rated flush volume will clarify potential confusion to the purchaser as to the actual water consumption of WaterSense labeled products.

Fourth, WaterSense agrees that referencing the *U.S. Code of Federal Regulations (CFR)* is unnecessary for this specification and potentially confusing. The reference to the *CFR*, therefore, has been removed. WaterSense’s marking requirements do not interfere with or supersede the regulatory marking requirements with which a manufacturer must comply.

WaterSense has made one additional point of clarification to Section 6.2, as follows:

“Marking must be in gpf and Lpf in at least two digit resolutions (e.g., 0.5 gpf [1.9 Lpf]).”

WaterSense recognizes that in some cases, the manufacturer may choose to mark the product/packaging in more than two digit resolution (e.g., 0.125 gpf [0.473 Lpf]).

VII. Comments on Section 9.0 – Definitions

- a. One commenter suggested adding: “CSA – Canadian Standards Association” to the list of terms to reflect the added CSA references in the specification.

Response: WaterSense agrees with this comment and has added CSA to the list of terms in the definitions section.

- b. One commenter suggested the definition of “Rated Flush Volume” be changed to:

“The stated average flush volume of the urinal fixture ~~or~~ and pressurized flushing device, as certified.”

Response: WaterSense has revised the definition of “rated flush volume” to read: “The maximum flush volume, as specified by the manufacturer, verified through testing and in compliance with this specification.”

This change was made to reflect changes to the specification in Section 3.1.1, which states:

- 3.1.1 The manufacturer shall specify a maximum flush volume (rated flush volume) of the flushing device or urinal fixture. The specified flush volume must be equal to or less than 0.5 gpf (1.9 Lpf).

WaterSense wants to clarify that it is the rated flush volume, and not the actual tested average maximum flush volume, that should appear on the product and product packaging (see Section 6.0 of the specification and Section VI of this document for further discussion).

- c. Though not directly commented on, WaterSense has added definitions for “flushing device” and “complete system,” for added clarification. A flushing device is a device employed in the operation of a urinal to deliver water into the urinal fixture. This includes pressurized flushing devices and flush tanks (gravity type), as defined in ASME A112.19.2/CSA B145.1. A complete system is any combination of flushing device and urinal fixture that have both been certified for the same rated flush volume and that when used together meet the requirements of this specification for water efficiency and performance.

VIII. Comments on Appendix A: Informative Annex for WaterSense Labeling

Independent Labeling of Urinal Fixtures and Pressurized Flushing Devices

- a. One commenter supported the proposed structure for allowing urinal fixtures and flushing devices to be labeled as a complete system or separately, as pressurized flushing devices and urinal fixtures are often sold separately and may be supplied by different manufacturers. Further, the commenter suggested that WaterSense should expressly state that pressurized flushing devices and fixtures that meet the criteria individually will be eligible to carry the WaterSense label and that specific pairings of WaterSense pressurized flushing devices and fixtures do not have to be listed as combinations for certification.

The commenter indicated that this approach guarantees that all certified products used together meet the high-efficiency requirements, while affording flexibility to manufacturers and distributors. In addition, the commenter indicated that mixing and matching of WaterSense labeled urinal fixtures or flushing devices with non-labeled counterparts is likely to result in readily evident improper function and will serve as a self-policing limit to this practice. Lastly, the commenter suggested that requiring all possible urinal fixture and flushing device combinations to be tested together would be extremely costly for manufacturers and would create an unnecessary reporting burden. The cost alone would likely limit the number of combinations available to end-users, and that these issues would only compound as new products are introduced and the number of possible combinations increases.

- b. One commenter recommended that in addition to the proposed certification requirements, that individual pressurized flushing devices and fixtures be labeled as having “component certification.” This will help prevent mismatching of valves and fixtures in the field. Similarly, the commenter recommended that WaterSense offer a “system certification” for those valves and fixtures that have undergone certification testing in combination. The commenter also suggested that manufacturers should be required to indicate the minimum amount of water volume their products require to meet the specification.
- c. One commenter indicated that while they agreed with the current approach of certifying the urinal fixtures and pressurized flushing devices separately, requiring only the pressurized flushing devices to be tested on multiple urinal fixtures (i.e., three different models), and not vice versa, discriminates against pressurized flushing device manufacturers. This commenter suggested that it was time to reevaluate how a fixture affects the use of a given amount of water instead of trying to match fixtures and fittings. The commenter went on to suggest that it is time to revise the ASSE #1037 standard so that pressurized flushing devices do not require testing on a urinal fixture. This would

help reduce testing costs and ensure that the public can be assured of a satisfactory flushing device no matter with which fixture it is used.

- d. Two commenters disagreed with the proposed structure for allowing urinal fixtures and flushing devices to be labeled as a complete system or separately. The commenters suggested that urinal fixtures and flushing devices must be designed to work together and tested and labeled as a system to ensure performance and proper function.

The commenters called attention to the fact that even though different makes and models of pressurized flushing devices might have the same maximum flush volume, they all have different discharge (flush) curves. The shape of the flushing device's flush curve must match the hydraulic need of the urinal fixture during the entire flush cycle. For example, a 0.5-gpf pressurized flushing device with a long, slow cycle will not rinse the fixture properly while a short, high flow rate can cause splashing. To prevent poor performing combinations and protect against public backlash, the commenters indicated that the pressurized flushing device and the urinal fixture need to be co-engineered and the WaterSense label should only apply to flushing devices and fixtures that have been tested in combination. In addition, one commenter pointed out that the WaterSense specification for tank-type high-efficiency toilets does not allow separate testing for bowls and tanks and that any future specification for high-efficiency flushometer valve toilets will not allow this approach.

One of the commenters suggested modifying the current text in Appendix A to say: "Certified urinal fixtures and pressurized flushing devices shall be labeled as a complete system. If sold separately, the manufacturer of each part must clearly indicate on product documentation that the part must be used with a WaterSense labeled counterpart that has been tested and certified in combination with that part, in order to ensure that the entire system meets the requirements of this specification for water efficiency and performance."

Response: WaterSense has decided not to change the proposed approach of allowing urinal fixtures and flushing devices to be labeled as a complete system or separately. As discussed in the supporting statement, independent certification is the current practice and is the least burdensome to manufacturers, particularly as many urinal fixtures and corresponding flushing devices are produced by different manufacturers. As comment (a) above asserts, requiring all possible combinations of flushing devices and fixtures to be tested together would be extremely burdensome and costly for manufacturers, and would only become more so as new products are introduced and the number of possible combinations increases. Maintaining an accurate and useful list of all possible labeled combinations of flushing devices and fixtures would also create an overwhelming administrative burden for WaterSense.

WaterSense does intend to conduct education and outreach to help ensure that labeled urinal fixtures and pressurized flushing devices are purchased in combination with labeled counterparts of the same rated flush volume. In addition, the marking requirements on both the urinal fixture and flushing device, as established in this specification, should also enable proper matching in the field.

Product Sampling for Certification

- e. Though not directly commented on, WaterSense has added new requirements specifying how certifying bodies are to select and sample products for certification. Sampling was not addressed in the draft specification, either directly or by reference. The requirements in the final specification specify that the manufacturer must provide, at a minimum, three samples of the model to be tested. Of those, the certifying body must choose at least one at random for testing to the requirements of the specification. This sampling regime is modeled after the recommended sampling scheme for initial certification as specified in Section A4 of the Nonmandatory Appendix A Demonstrating Compliance to ASME A112.19.2 and is consistent with sampling requirements specified in the WaterSense High-Efficiency Tank-Type Toilet Specification.

IX. Comments on Supporting Documentation

Estimated Water Savings

- a. Two commenters indicated that WaterSense significantly underestimated the potential water savings associated with high-efficiency urinals. Specifically the commenters indicated that WaterSense underestimated the number of daily flushes per urinal fixture.

One commenter pointed to the fact that building codes generally only require one water closet per 150 occupants and that typical construction practices yield one urinal per 25 to 50 male occupants. In addition, the U.S. Department of Defense (DOD) water conservation guidance suggests the potential savings with high-efficiency urinals is about 520 gallons per person per year, which results in a potential range of savings of 6,500 to 13,000 gallons per urinal per year (as opposed to WaterSense's estimate of 4,600 gallons per year).

Another commenter reported that its agency uses an estimate of 2.25 uses per urinal per day per male employee (WaterSense assumed 2.0 uses per day per male) and an average of one urinal per 30 to 40 male employees. This yields an estimated 70 to 90 uses per urinal per day. The commenter went on to suggest changing the estimated savings to a higher figure based on urinal use in an office setting and urged WaterSense to provide footnotes indicating the underlying assumptions and calculations, noting that the calculation may be performed for each individual building to make the business case for retrofitting urinals.

Response: In making its estimates on potential national water savings associated with WaterSense labeled flushing urinals, WaterSense chose an approach that was intentionally conservative. While the assumptions and estimates on the daily number of uses and number of males per urinal and overall approach presented by the commenters may be equally valid, WaterSense's approach is intended to project gross potential national water savings. WaterSense's estimate was based on nationally applicable urinal stock data instead of potential facility-specific usage data.

Despite the differences in approaches and resulting savings estimates, WaterSense encourages others making facility-specific estimates to use an approach, such as those proposed above (e.g., uses per urinal per day and number of males per facility), based on site-specific data where available to provide the most accurate estimate of potential water savings.

- b. One commenter suggested striking the terms “raised primarily in the context of non-water urinals” from the statement on page 5 of the Draft WaterSense High-Efficiency Flushing Urinal Specification Supporting Statement that reads: “WaterSense noted previously some concerns regarding the buildup of urine solids in the drain line leading to restricted flow or clogging, raised primarily in the context of non-water urinals.”

Response: Supporting documentation for the final specification does not include any references to drain line buildup, either in the context of flushing or non-water urinals.